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(54) **COAXIAL WAVEGUIDE MICROSTRUCTURE HAVING CONDUCTIVE AND INSULATION MATERIALS DEFINING VOIDS THEREIN**

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This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**  
**H01P 3/06** (2006.01)

(52) **U.S. Cl.** ..... **333/244; 174/117 AS**

(58) **Field of Classification Search** ..... **333/243, 333/244; 174/117 AS, 28; 29/828**

See application file for complete search history.

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(57) **ABSTRACT**

Provided are coaxial waveguide microstructures. The microstructures include a substrate and a coaxial waveguide disposed above the substrate. The coaxial waveguide includes: a center conductor; an outer conductor including one or more walls, spaced apart from and disposed around the center conductor; one or more dielectric support members for supporting the center conductor in contact with the center conductor and enclosed within the outer conductor; and a core volume between the center conductor and the outer conductor, wherein the core volume is under vacuum or in a gas state. Also provided are methods of forming coaxial waveguide microstructures by a sequential build process and hermetic packages which include a coaxial waveguide microstructure.

**14 Claims, 18 Drawing Sheets**

